

**WHAT IS CLAIMED IS:**

1. A method of inverting at a work location an article having first and second opposed surfaces both of which are generally normal to the article's periphery, which

5 comprises:

closing one end of an article-periphery-conformal aperture formed through a member to render the aperture a blind aperture;

10 inserting the article into the blind aperture so that the first article surface is supported at the blind end of the aperture and its second surface is exposed at the work station;

closing the other end of the aperture to render the aperture a closed aperture;  
and

15 thereafter, inverting the carrier so that should the one aperture end be opened, the first article surface is exposed at the work station.

2. A method as in Claim 1, which further comprises:

opening the one aperture end to expose the first article surface within the blind aperture at the work station.

3. A method as in Claim 2, which further comprises:

removing the article first-side-up from the blind aperture at the work station.

4. A method as in Claim 4, wherein:

5 the article is a BGA semiconductor device the first surface of which carries an  
array of one or more conductive balls,  
the member is a waffle pack, and  
the BGA device is initially inserted into the blind aperture with its second surface  
exposed following, and as a result of, a previous die bonding operation.

5. A method of packaging a BGA semiconductor device having first and second opposed surfaces both of which are generally normal to the device's periphery, a first surface of the device carrying an array of contact balls, which comprises:

closing one end of a device-periphery-conformal aperture formed through a

5 member to render the aperture a blind aperture;

inserting the device into the blind aperture so that the balls on the first article surface are supported at the blind end of the aperture and its second surface is unsupported and exposed; and

closing the other end of the aperture to render the aperture a closed aperture;

10 the member being manipulable so that thereafter opening the one end of the closed aperture with the second surface of the device supported exposes the first device surface with the balls thereon.

6. A method as in Claim 5, wherein:

the member has plural apertures formed therethrough, one or more of which apertures may contain a BGA device,

the one end closing step simultaneously closes the one end of each aperture,

5 the other end closing step simultaneously closes the other end of each aperture, and

the one end opening step simultaneously opens the one end of each aperture to simultaneously expose the first device surfaces and the balls thereon.

10 7. A method as in Claim 5, which further comprises:

manipulating the member so that the second surface of the device is supported within the closed aperture and the first surface is unsupported, and

15 after manipulation, opening the one end of the closed aperture exposes the first device surface and the balls thereon.

8. A method as in Claim 7, wherein:

the member has plural apertures formed therethrough, one or more of which apertures may contain a BGA device,

the one end closing step simultaneously closes the one end of each aperture,

5 the other end closing step simultaneously closes the other end of each aperture,

and

the one end opening step simultaneously opens the one end of each aperture to simultaneously expose the first device surfaces and the balls thereon.

10  
"BGA" 1001

9. A carrier for an article having first and second opposed surfaces both of which are generally normal to the article's periphery, which comprises:

a member having an article-periphery-conformal aperture therethrough, the aperture being adapted to receive the article when the member is in a first orientation;

5 a first cover removably associable with one side of the member to render the aperture a blind aperture into which blind aperture an article is insertable with the first surface abutting the first cover and the second surface exposed;

10 a second cover removably associable with the other side of the member to render the blind aperture a closed aperture in which closed aperture an inserted article may be held, the member being manipulable into a second orientation wherein the second surface abuts the second cover so that the article is presented with the first side exposed following removal of the second cover.

10. A package which includes the carrier of Claim 9, and wherein:

15 the carrier contains plural apertures,  
one or more articles are carried in the apertures, and  
both covers are associated with the member.

11. A package as in Claim 10, wherein  
the articles are BGA semiconductor devices, the first side of each of which carries  
a grid of conductive balls.